Alberta
EDUCATION

Devonian Building, West Tower, 11160 Jasper Avenue, Edmonton, Alberta, Canada T5K 0L2

May, 1983

TO THE READER:

This report describes a five-year longitudinal study of the extent and type of adolescent girls' participation in physical activity in order to determine what variables were most related to physical activity participation as the girls matured. This report will be of interest to physical education teachers and supervisors and those who are involved in intramural and interschool sports.

The Planning Services Branch is pleased to make this report available. We hope that you will find it useful.

Yours sincerely,

H.I. Hastings

H.I. Hastings
Director
Planning Services

Adolescent Girls' Participation in Physical Activity

by

Janice Butcher, Ph.D
Faculty of Physical Education
and Recreation Studies
University of Manitoba
Winnipeg, Manitoba
R3T 2N2

M. Ann Hall, Ph.D
Faculty of Physical Education
and Recreation
University of Alberta
Edmonton, Alberta
T6G 2H9

Funded by the
Planning Services Branch
Alberta Education
Edmonton, Alberta

February 28, 1983

83-3

Table of Contents

	Page
INTRODUCTION	1
A. Overview of the Study	1
B. Purpose of the Study	1
DESIGN OF THE STUDY	1
A. Variables Included in the Study	1
B. The Sample	2
C. Collection of Data	3
RESULTS	3
A. Analysis of Physical Activity Participation	3
B. Changes in Related Variables by Grade	10
C. Relationship between Participation and Related Variables	13
SUMMARY AND CONCLUSIONS	18
RECOMENDATIONS	19
APPENDIX	
A. Variables and Instruments Included in Study	21

List of Tables

Table	Page
1. Subjects Completing the Survey - Year 1-5	3
2. Comparison of Participation Variables by Grade	5
3. Number of Girls Participating in Increasing Activities	7
4. Number of Girls Showing Change in Participation	8
5. Number of Girls Showing Change in Participation - Grades 6 to 10	9
6. Girls Who Never Participated or Consistently Participated Over 5 years	10
7. Comparison of Related Variables by Grade	11
8. Related Variables Showing Significant Differences between Above and Below Average Participants	14
9. Comparison of Non-Participants and Participants at Least One Year: Interschool Teams	16
10. Comparison of Non-Participants and Participants for all Five Years: Community Organized Activities	17

INTRODUCTION

A. Overview of the Study

A five year longitudinal survey was undertaken in the Edmonton Catholic School District from May, 1978 to May, 1982 to assess the physical activity participation of adolescent girls. A questionnaire was designed to obtain data on adolescent girls' participation in physical activity and on other variables related to that participation. The questionnaire was first administered to Grade 6 girls in May, 1978 and was readministered to the same girls for the next four years.

B. Purposes of the Study

The purposes of the study were twofold:

1. To determine if the extent and type of adolescent girls' participation in physical activity changed with age.
2. To determine what variables were most related to physical activity participation as the girls matured.

DESIGN OF THE STUDY

A. Variables Included in the Study

a. Physical Activity Participation Variables

Physical activity participation was measured in six ways:

1. number of interschool teams
2. number of intramural activities
3. number of community-organized activities
4. average hours per day spent in physical activity
5. total number of activities participated in
6. frequency of participation in four favourite activities.

b. Variables Related to Participation in Physical Activity

Several variables felt to be related to participation in physical activity were included in the study. A theoretical model explaining involvement in physical activity suggests that three major factors are important:

1. Personal attributes
2. Socializing agents (significant others)
3. Socialization situations (opportunity set)

Variables from each of these categories were selected and instruments chosen or constructed to measure each. The related variables included in the study and the instruments used to measure them are outlined in Appendix A.

B. The Sample

The sample was taken from the population of all Grade 6 girls in the Edmonton Catholic School District in May, 1978. All elementary and elementary-junior high schools in the district were randomly sampled. An original sample of at least 200 girls was desired. Based on average Grade 6 enrollments in the schools, it was estimated that 13 schools would be needed to provide 200 girls. Thus, 13 schools were chosen using a random number table and all Grade 6 girls enrolled in those schools were selected into the sample. As it turned out, the 13 schools had 213 girls in Grade 6, of which 207 girls completed the questionnaire in year 1 of the study. Table 1 outlines the number of girls who were resurveyed in the subsequent four years. Attrition was due to moving from Edmonton, withdrawing from school, or being ill/truant on the testing days. Nevertheless, the dropoff rate was minimal for the longitudinal study as 140 girls (67.6% of the original sample) completed the survey in each of the five years. The sample was most stable during the junior high school years with the major dropoffs occurring between elementary and junior high, and between junior and senior high school.

Table 1
Subjects Completing the Survey - Years 1 - 5

Grade	Date	Subjects Completing
Grade 6	May, 1978	207
Grade 7	May, 1979	181
Grade 8	May, 1980	165
Grade 9	May, 1981	163
Grade 10	May, 1982	140

C. Collection of Data

The subjects completed the survey during school hours in classrooms or libraries in their respective schools. Two one-hour sessions on different days were required for Grade 6 to 9, with only one 75 minute session required for the Grade 10 girls because of their improved reading ability. The first author administered the questionnaire herself to groups ranging from 10 to 30 girls in a session. For each instrument, the instructions were carefully explained with the help of a large poster and an example. The author was also available as the girls worked to answer any questions.

RESULTS

A. Analysis of Physical Activity Participation

The first question addressed by the study was whether there were changes in physical activity participation as the girls matured. To answer the question, three types of analyses were done: comparing the participation means over the five grades, comparing the numbers of girls who participated in no, one, two, three, etc. activities over the five years, and calculating the amount of change for each individual girl.

To compare average participation over the five grades, a univariate repeated measures analysis of variance was performed for each of the six participation variables and the two secondary involvement variables. The means of participation for the 140 subjects for each of the five years of the study are outlined in Table 2.

All of the variables showed significant differences between grades except for frequency of four favourite activities. The number of interschool teams increased from Grade 6 through junior high school with a drop-off on entering senior high school. Intramural participation remained fairly high and consistent from Grade 6 to 9 with a dramatic decrease in Grade 10. Community organized activities declined in the early years of the study and then participation remained stable. There was a consistent decrease in the average number of hours per day spent in physical activity from Grade 6 to 10. The total number of activities participated in peaked in Grade 8 and then declined, with the number in Grade 6 and Grade 10 being fairly similar. There were no grade differences in the frequency of participation in the four favourite activities. Spectating at live sports events and secondary involvement such as listening to sport on radio and television and reading about it in newspapers increased through the five years. It appears that, generally, older adolescent girls participate less in physical activity but are more involved in spectating, either in person or through the media.

To supplement the information given by comparing means of participation, frequencies were calculated indicating the number of girls who participated in no, one, two, etc. activities of each type. The results are summarized in Table 3. It can be seen for interschool teams that the majority of the subjects (for example, Grade 9 - 58%, Grade 10 - 76%) did not compete on any school teams. Most of the participants competed on only 1 team and very few belonged to three or more teams. The statistics are quite different for intramural activities. The majority of the girls (except for Grade 10) competed in at least one activity and most participated in four or more. Intramural participation in Grade 10 showed a

Table 2

Comparison of Participation Variables by Grade

Participation Variable	Grade	Number of Activities	Standard Deviation	F Statistic	Significance
Interschool[a] Teams	6	1.29	.77	5.12	.001
N = 137	7	1.34	.63		
	8	1.49	.76		
	9	1.64	.91		
	10	1.31	.69		
	Total	1.42	.77		
Intramural[a] Activities	6	3.60	1.81	37.82	.000
N = 137	7	3.76	1.36		
	8	3.44	1.58		
	9	3.49	1.50		
	10	1.86	1.28		
	Total	3.24	1.66		
Community[a] Organized Activities	6	2.02	1.08	4.29	.003
N = 132	7	1.89	1.03		
	8	1.67	.86		
	9	1.68	.94		
	10	1.63	.94		
	Total	1.78	.98		
Average Hours Per Day	6	4.45	2.27	16.36	.000
N = 99	7	3.65	1.66		
	8	3.27	1.56		
	9	2.58	1.44		
	10	2.43	1.58		
	Total	3.27	1.87		
Total Activities	6	11.40	5.08	4.77	.001
N = 133	7	12.68	4.60		
	8	13.42	5.39		
	9	12.60	4.69		
	10	11.85	4.63		
	Total	12.39	4.93		
Frequency of Favorite Activities[b]	6	3.17	.74	1.50	.21
N = 131	7	3.15	.73		
	8	2.99	.78		
	9	3.03	.77		
	10	2.98	.71		
	Total	3.06	.75		

Table 2 cont.

Participation Variable	Grade	Number of Activities	Standard Deviation	F Statistic	Significance
Spectating Sports Events[b]	6	2.58	1.51	6.02	.000
N = 132	7	2.85	1.43		
	8	2.61	1.30		
	9	3.14	1.22		
	10	3.06	1.22		
	Total				
Secondary Involvement (T.V., Radio, Newspaper)[b]	6	2.87	1.09	5.80	.000
N = 133	7	3.15	1.11		
	8	3.21	1.10		
	9	3.47	1.17		
	10	3.25	1.24		
	Total				

[a]Coded Values:
1. no activities
2. one activity
3. two activities
4. three activities
5. four or more activities

[b]Coded Values:
1. less than once a month
2. at least once or twice a month
3. once a week or every weekend
4. at least two or three times a week
5. every day without fail in season

Table 3

Number of Girls Participating in Increasing Activities

	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
Interschool Teams					
no teams	115	101	91	81	107
1 team	17	32	34	38	21
2 teams	3	6	11	12	6
3 or more	5	1	4	9	3
Total N	140	140	140	140	137
Intramural Activities					
no activities	42	9	29	17	80
1 activity	4	26	10	27	27
2-3 activities	12	43	41	36	18
4 or more	82	62	60	60	12
Total N	140	140	140	140	137
Organized Activities					
no activities	57	64	72	79	79
1 activity	39	42	46	36	41
2 activities	27	22	14	16	8
3 or more	15	12	6	8	8
Total N	138	140	138	139	136
Hours Per Day					
1 - 1.9	15	20	17	40	49
2 - 3.9	33	45	73	55	59
4 - 5.9	38	52	36	26	14
6 or more	40	14	8	5	6
Total N	126	131	134	126	128
Total Activities					
1 - 5	13	6	6	8	8
6 - 10	53	42	40	41	51
11- 15	50	58	45	56	48
16- 20	15	27	31	28	22
21 and over	8	7	17	7	6
Total N	139	140	139	140	135
Frequency of Favourite Activities					
value					
Once/Year (.25 - 1)	1	1	0	4	1
Once/Month(1.25- 2)	15	8	19	12	12
Once/Week (2.25- 3)	44	59	60	59	65
2-3 Times/week (3.23-4)	66	62	49	56	51
Everyday (4.25-5)	12	10	11	7	6
Total N	138	140	139	138	135

reverse trend with the majority not participating. It would be valuable to know if this dramatic change in participation is due more to lack of interest or opportunity. Approximately half of the subjects participated in at least one community organized activity with slightly more in Grade 6.

For average hours per day spent in activity, Grade 6 girls tended to give responses of four hours or more while Grade 10 girls answered with less than four hours per day. For both total activities participated in and frequency of four favourite activities, the number of responses in each category was quite similar across the five grade levels.

The amount of participation change over the five years was calculated for each individual girl to determine how many girls had increased or decreased in participation or had remained the same. The statistics are displayed in Tables 4 and 5. For interschool teams, the comparison was made between Grades 7 and 10 because some elementary schools (Grade 6) did not have interschool teams and the results

Table 4

Number of Girls Showing Change in Participation

	Interschool		Intramural		Community
	Gr. 7-10	Gr. 7-9	Gr. 6-10	Gr. 7-9	Gr. 6-10
Remained same					
no participation	80	63	23	3	40
1 or 2 teams	6	14	2	18	27
3 or more teams	0	0	11	58	3
Decreased					
$\geq$ 3 teams to $\leq$ 2 teams	1	0	76	30	12
1-2 teams to none	27	18	5	10	31
Increased					
none to $\geq$ 1 team	18	38	19	6	14
one to $\geq$ 2 teams	5	7	1	15	8
	137	140	137	140	135

would have been misleading. A comparison within junior high (Grades 7-9) was also made for interschool teams and intramural activities because the consistent nature of the programs within that setting would yield very meaningful participation changes.

The majority of the subjects remained the same in interschool participation (most not participating) from Grade 7 to 9/10, with about the same number decreasing and increasing in number of teams. For intramural teams, the results were quite different between the Grade 7-9 comparison and the Grade 6-10 comparison. For Grade 7-9, over half the subjects remained consistent in their participation, while a few more girls decreased in participation than increased. However, comparing Grades 6 to 10, the majority decreased in participation, as would be expected from the previously reported mean scores. The community organized activities showed fairly consistent participation (40 not participating), with slightly more girls decreasing the number of activities compared to increasing.

The changes in participation for the remaining three variables (presented in Table 5) were more difficult to categorize. The comparison between Grade 6 and 10 participation for each variable was made relative to the average value for all five years combined. The results are also more difficult to interpret. Average hours per day tended to decrease from Grade 6 to 10, while the total number of

Table 5

Number of Girls Showing Change in Participation - Grades 6 to 10

	Hours/Day	Total Activities	Favourite Frequency
Remained same			
above average	12	19	33
below average	34	73	36
Decreased	63	15	41
Increased	7	27	24
	116	134	134

activities participated in tended to remain unchanged. The frequency of four favourite activities seemed to either remain stable or to decrease.

The tables comparing participation in Grade 6 and then in Grade 10 do not indicate the changes between those grades. Table 6 shows the number of girls who never participated in interschool, intramural, and community activities in any of the five years of the study. It also indicates the number who participated in all of the five years and the number who participated at least one year. Interschool teams had the most girls (45 - 33%) never participating over 5 years while intramural activities had the most girls (36 - 26%) participating in all five years. This breakdown in non-participants and consistent participants over five years will be used to compare the related vaiables in a later section of the report.

Table 6

Girls Who Never Participated or Consistently Participated Over 5 Years

	Interschool N= 137	Intramural N= 137	Community N= 132
Never participated over 5 years	45	0	26
Participated all 5 years	2	36	18
Participated at least once	92	137	106

B. Changes in Related Variables by Grade

A repeated measures analysis of variance was performed for each of the related variables to determine which variables showed significant differences between grades. Table 7 displays only the related variables that had differences below the .05 probability level. Three interest variables were significantly different between grades. The values are derived from a vocational counselling assessment instrument. Realistic interests include working with mechanical and electrical things. These interests increased until

Table 7

Comparison of Related Variables by Grade

Related Variable	Grade	Value	Standard Deviation	F Statistic	Significance
Realistic Interests N= 130	6	.43	.27	3.42	.011
	7	.47	.29		
	8	.50	.30		
	9	.45	.33		
	10	.41	.33		
Investigative Interests N = 127	6	.52	.24	13.06	.000
	7	.51	.26		
	8	.45	.26		
	9	.44	.26		
	10	.36	.25		
Artistic Interests N = 130	6	.71	.19	6.50	.000
	7	.62	.22		
	8	.62	.23		
	9	.65	.22		
	10	.62	.24		
Physical Education Satisfaction N=131	6	3.78	.45	3.36	.012
	7	3.64	.47		
	8	3.61	.53		
	9	3.64	.49		
	10	3.71	.53		
Physical Activity for Social Experience N=135	6	5.71	.66	3.76	.006
	7	5.64	.71		
	8	5.55	.70		
	9	5.58	.74		
	10	5.80	.71		
Physical Activity for Release N=130	6	5.28	1.05	3.62	.008
	7	5.33	.83		
	8	5.30	.90		
	9	5.42	1.09		
	10	5.60	.83		

Table 7 cont.

Related Variable	Grade	Value	Standard Deviation	F Statistic	Significance
Physical Activity for Competition N=121	6	5.61	.96	6.93	.000
	7	5.48	1.06		
	8	5.19	1.05		
	9	5.37	.90		
	10	5.08	1.04		
Image of Female Athlete N=121	6	5.88	.85	2.51	.046
	7	5.90	.88		
	8	5.72	.91		
	9	5.74	.92		
	10	5.66	.85		
Father's Socialization Influence N=107	6	4.55	1.01	8.53	.000
	7	4.51	1.15		
	8	4.33	1.07		
	9	4.14	1.10		
	10	3.99	1.08		
Mother's Socialization Influence N=117	6	4.52	1.04	8.53	.000
	7	4.51	1.04		
	8	4.25	1.05		
	9	4.13	1.07		
	10	3.97	1.08		
Significant other's participation N=132	6	4.93	.97	4.06	.004
	7	5.01	.90		
	8	4.92	.83		
	9	4.75	.91		
	10	4.66	.90		
Sports equipment available N=91	6	2.98	1.66	33.54	.000
	7	3.66	1.58		
	8	5.10	2.40		
	9	5.30	2.63		
	10	5.15	1.88		

Grade 8 and then declined again. Investigative interests include interests in the physical sciences (chemistry, physics) and scientific experiments while artistic interests involve art, drama, poetry, music, and photography. Both of these interests significantly declined with age.

Satisfaction with physical education classes tended to decline during junior high school and was approximately equal in Grades 6 and 10. Attitudes toward three reasons for physical activity also differed by grade. Physical activity for a social experience was more important in Grades 6 and 10 than in junior high. Release of tension became more important with age while competition became less important. The image of the female athlete declined through the five years. Yearly decline was also seen for three of the socialization variables: father's and mother's socialization influence and significant others' participation. The girls perceived less encouragement, support, and example from significant others as they grew older. However, they did report more sports equipment available to them in later years.

C. Relationship between Participation and Related Variables

To investigate the relationship between participation and related variables, means for subjects showing above average participation over the five years were compared to means of subjects with below average participation using the Students' *t* statistic. The related variables showing significant differences between the two groups for each of the six participation variables are included in Table 8.

For interschool teams five of the interests[1] from the vocational counselling instrument showed significant differences with the above average participants expressing greater interest in all cases. The

---

[1] Social interests include interacting with people and attending social/public functions while enterprising interests involve politics, business, influencing others and being a leader. The other three interests were described earlier.

Table 8

Related Variables Showing Significant Differences between Above and Below Average Participation

Related Variables	Above Average Participation Mean	Below Average Participation Mean	T-Value	2 Tail Probability
I. Interschool Teams	N = 48	N = 89		
Realistic interests	.50	.37	2.23	.027
Investigative interests	.42	.33	2.05	.042
Artistic interests	.71	.59	2.82	.005
Social interests	.82	.74	3.83	.000
Enterprising interests	.57	.49	2.09	.038
Movement satisfaction	3.90	3.67	2.96	.004
Independent, self-assertive, self-descriptions	-.01	.34	-3.84	.000
Physical activity for release of tension	5.79	5.49	1.99	.049
Prefer active over sedentary activities	3.44	2.93	3.77	.000
Significant others' encouragement	4.91	4.58	2.47	.015
II. Intramural Activities	N = 71	N = 66		
no variables with significant differences				
III. Community Organized Activities	N = 62	N = 71		
Investigative interests	.42	.32	2.08	.040
Movement satisfaction	3.88	3.63	3.40	.001
Independent, assertive self-descriptions	.01	.40	-4.45	.000
Satisfaction with phys. educ.	3.83	3.63	2.12	.036
Physical activity for beauty	6.15	5.79	2.49	.014
Physical activity for release of tension	5.76	5.48	1.99	.049
Physical activity for training	4.71	4.29	2.16	.032
Physical activity for competition	5.28	4.88	2.10	.038
Image of female athlete	5.89	5.50	2.63	.010
Prefer active over sedentary activities	3.29	2.94	2.58	.011
Father's socialization influence	4.27	3.61	3.59	.000
Mother's socialization influence	4.17	3.65	2.83	.005
Significant others' encouragement	4.85	4.56	2.27	.025
Socio-economic status	2.89	2.01	3.81	.000
Sports equipment available	5.41	4.66	2.09	.038

Table 8 cont.

Related Variables	Above Average Participation Mean	Below Average Participation Mean	T-Value	2 Tail Probability
IV. Average Hours Per Day	N = 51	N = 48		
Enterprising interests	.58	.47	2.60	.011
Prefer active over sedentary activities	3.33	2.98	2.31	.023
Sports equipment available	5.68	4.49	3.37	.001
V. Total Activities	N = 60	N = 75		
Realistic interests	.48	.36	2.20	.030
Artistic interests	.68	.59	2.05	.042
Social interests	.80	.74	2.93	.004
Movement satisfaction	3.85	3.67	2.28	.024
Independent, assertive self-descriptions	-.02	.42	-5.25	.000
Image of female athlete	5.88	5.53	2.38	.019
Prefer active over sedentary activities	3.42	2.87	4.34	.000
Father's socialization influence	4.19	3.74	2.39	.019
Significant others' encouragement	4.88	4.55	2.62	.010
Sports equipment available	5.79	4.41	3.95	.000
VI. Frequency of Four Favourite Activities	N = 69	N = 62		
Movement satisfaction	3.85	3.65	2.73	.007
Body cathexis	3.64	3.44	2.72	.007
Independent assertive self-descriptions	.12	.29	-2.02	.045
Physical activity for health	5.89	5.57	2.09	.038
Physical activity for thrill	4.82	4.41	2.36	.020
Physical activity for beauty	6.14	5.79	2.37	.019
Physical activity for training	4.75	4.27	2.52	.013
Physical activity for competition	5.30	4.82	2.45	.015
Image of female athlete	5.88	5.49	2.54	.012
Father's socialization influence	4.11	3.71	2.08	.039
Sports equipment available	5.41	4.63	2.17	.031

other significantly different variables included four personal attributes: movement satisfaction, independent, assertive self-descriptions,[2] attitude toward physical activity for release of tension, and preference for active over sedentary activities. Finally, significant others' encouragement also showed significant differences between above and below average interschool participants.

In an attempt to narrow down the relationship between interschool participation and the related variables even further, non-participants (girls who did not compete in any of the five years) were contrasted with participants for at least one year. Table 9 displays the seven variables that were significantly different. It is mainly personal attributes that separate the two groups with

Table 9

Comparison of Non-Participants and Participants At Least One Year Interschool Teams

Related Variable	Participants' Mean N = 92	Non-Participants' Mean N = 45	T-Value	2 Tail Probability
Social interests	.79	.72	-3.07	.003
Enterprising interests	.55	.47	-1.93	.056
Movement satisfaction	3.82	3.62	-2.49	.014
Independent, assertive self-descriptions	.10	.45	3.80	.000
Activity preference	3.34	2.64	-5.33	.000
Significant others' participation	4.77	4.40	-2.29	.024
Sports equipment available	5.26	4.41	-2.18	.031

[2] For the variable, independent, assertive self-descriptions, a value closer to zero indicates more of such a self-description. The values are derived from Bem's (1974) Sex Role Inventory and actually include other traits such as self-reliance and leadership.

traits of confidence in their movement (movement satisfaction, activity preferences) and themselves (independent, assertive self-descriptions) coming out strong. Enterprising interests also require leadership qualitities. These traits seem to encourage adolescent girls to compete in highly organized and competitive interschool teams.

For intramural activities there were no variables with significant differences between above and below average participants. The related variables included in the study could not distinguish between the two groups and it would appear that there are no identifiable characteristics of above average intramural participants. Because all girls in the study (Table 6) participated in intramurals for at least one year, further analysis could not be undertaken.

Above average participants in community organized activities had significantly higher values on 15 of the 26 related variables (Table 8), so there was a great deal of difference between the two groups. Again, to try and narrow down these variables, non-participants (never participated in any of the five years) were compared to girls who had participated every single year for the five years. The eight significant variables are outlined in Table 10.

Table 10

Comparison of Non-Participants and Participants for All Five Years
Community Organized Activities

Related Variable	Participants' Mean N = 18	Non-Participants' Mean N = 26	T-Value	2 Tail Probability
Investigative interests	.48	.32	-2.11	.041
Independent, assertive self-descriptions	.04	.53	3.34	.002
Physical activity for competition	5.51	4.73	-2.25	.030
Father's socialization influence	4.56	3.30	-4.34	.000
Mother's socialization influence	4.46	3.44	-3.37	.002
Significant others' participation	5.07	4.41	-2.67	.011
Significant others' encouragement	5.04	4.54	-2.36	.023
Socio-economic status	2.94	1.68	-3.21	.003

The majority of the variables were socialization variables showing the importance of significant others' encouragement, support and example. High socio-economic status would also help provide the means and the opportunities to participate in community organized activities. For this participation variable, then, personal attributes were not as important as socialization factors.

There were only three variables that separated girls who participated in above average hours per day from below average participants (Table 8). However, since 'average hours per day' was a continuous variable, this made further analysis difficult. There did not appear to be much identifiable difference between the two groups.

For the two remaining variables, total activities participated in and frequency of four favourite activities, there were respectively 10 and 11 significantly different related variables between above and below average participants (Table 8). Both of these participation variables are difficult to interpret. Subjects with the same total number of activities could have quite different amounts of participation time depending on how often and how vigorously they were involved. Also, the frequency of four favourite activities could be misleading if the girls' favourite activities (for example, skiing, roller skating, wind surfing) were not participated in as frequently as other activities due to the cost and lack of opportunity. Nevertheless, it is interesting to note the reoccurrence of several significantly different variables: movement satisfaction; independent, assertive self-descriptions; image of the female athlete; father's socialization influence; and sports equipment available. These same variables appeared for some of the other participation variables.

SUMMARY AND CONCLUSIONS

Based on the results of the study, the following conclusions can be made:

1. Overall, participation in physical activity declined as the girls matured from Grades 6 to 10. Five of the six participation variables had significantly lower values in Grade 10.

2. Participation in interschool teams and intramural activities dropped off abruptly in Grade 10. The dropoff was more gradual for community organized activities and average hours per day.

3. Several related variables also changed over the five years as the girls moved from elementary to senior high school:
   a) Realistic, investigative, and artistic interests declined.
   b) Satisfaction with physical education was lowest in junior high school.
   c) Attitudes toward physical activity for a social experience was low in junior high school. Physical activity for release of tension became more important with age while competition became less important.
   d) The image of the female athlete declined.
   e) Father's and mother's socialization influence and significant others' participation declined.
   f) Amount of sports equipment available increased over the five years.

4. Personal attributes expressing confidence in their movement and themselves separated participants and non-participants in interschool teams.

5. There were no related variable differences between above and below average participants in intramural activities.

6. Socialization variables and socio-economic status separated participants and non-participants in community organized activities.

7. Several significantly different related variables reoccured for many of the participation variables:
   a) movement satisfaction
   b) independent, assertive self-descriptions
   c) Socialization variables
   d) Sports equipment available

   These variables seem very important for explaining participation in different types of physical activity.

RECOMMENDATIONS

Several recommendations can be made for further action in school physical education programs:

1. Girls must be encouraged to remain active in physical activity throughout adolescence and adulthood.

2. The opportunities available to girls in senior high schools for intramural and interschool participation should be investigated. Every effort should be made to ensure that intramural and interschool programs are available to all girls who desire them.

3. An examination of the related variables that changed significantly over the five years points to some strategies that could be used to enhance participation:
    a) Because physical activity for release of tension became more important with age while competition became less important, types of activities in physical education classes must change with age to cater to these changing motives. The number of competitive activities must be decreased and the number of cathartic activities increased.
    b) Unfortunately, it still appears that the image of the female athlete/participant must be enhanced. It declined with age and also showed significant differences between above and below average participants.
    c) Socialization variables (significant other's participation and encouragement) were highly related to physical activity participation, particularily to community organized activities. However, the influence declined with age coinciding with a decline in participation. Somehow, significant others, especially parents, must be made to recognize the importance of girls' lifelong participation in activity and must be encouraged to support girls in their activities throughout senior high school.

4. Socio-economic status and sports equipment available were important for participation, especially for non-school related activities. Because individual girls cannot change these variables, school, recreational and community programmers should strive to provide low-cost programs that would be feasible for girls from lower socio-economic backgrounds.

5. Physical education programs should strive to enhance girls' movement satisfaction (confidence in physical skills) as this was strongly related to all types of participation. This could partially be done by improving sport skill and personal fitness levels.

APPENDIX A

VARIABLES AND INSTRUMENTS INCLUDED IN STUDY

A. Personal Attributes

1. Self esteem - Rosenberg's (1965) Self Esteem Scale
2. Body cathexis - Secord and Jourard's (1953) Body Cathexis Scale
3. Movement satisfaction - Nelson and Allen's (1970) Scale for Appraisal of Movement Satisfaction
4. Interest in six types of Activities - Holland's (1972) Self-Directed Search
5. Tomboyism - Author-constructed item
6. Activity preference - Author-constructed item
7. Sex role orientation - Bem's (1974) Sex Role Inventory
8. Image of the female athlete - Semantic differential
9. Satisfaction with physical education - Author - constructed instrument
10. Attitude toward physical activity (7 sub-domains)- Simon and Smoll's (1974) Children's Attitude Toward Physical Activity Inventory

B. Socializing Agents (Author-Constructed Items)

1. Significant others' participation
2. Significant others' encouragement
3. Father's socialization influence
4. Mother's socialization influence
5. Sibling sex status

C. Socialization Situations

1. Socio-economic status - Blishen and McRobert's (1976) Socio-Economic Index
2. Amount of sports equipment - author-constructed item